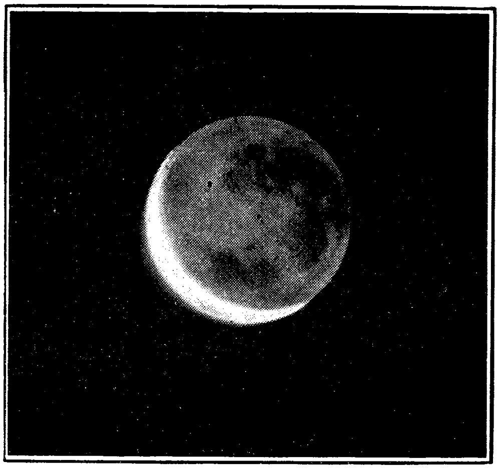
1895MNRAS..55..456B

On a Photographic Study of the Earth-lit Portion of the New Moon. By E. E. Barnard, M.A., D.Sc.

I have recently been making some experiments in photographing the Earth-lit portion of the new Moon with the 6-inch Willard portrait lens. The more prominent details are easily shown in the earlier stages, before the Moon becomes too old.

I have thought it would be interesting to make a series of such photographs, both in the evening and morning phases, for the study of any peculiarities in this illumination.

The first of these pictures was made on 1895 February 26, at about half-past seven. This is a very beautiful picture. The Earth-lit globe stands out beautifully round, encircled by the slender crescent. All the "seas" are conspicuously visible, as are also the other prominent features, especially the region about *Tycho*. *Aristarchus* and *Copernicus* appear as bright specks, and the light streams from *Tycho* are very distinct.



Photograph of New Moon (enlarged), 1895 February 26. 7h or 8h.
Exposure 30s. Lick Observatory, 6 in. Willard portrait lens.

For the inspection of the Society I send two glass positives from this picture; the smaller one is a direct contact positive, and is consequently of the original size, while the other is enlarged a couple of times. The exposure was 30 seconds.

Mount Hamilton, California:
1895 *May* 4.

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The Thermal Radiation from Sun Spots. Observations made at Daramona, Streete, co. Westmeath. By W. E. Wilson.

In 1894 March Dr. Johnstone Stoney kindly communicated to the Royal Society some observations of mine on the above subject.* In this preliminary note a full description is given of the instruments and of the method of observations. It is therefore unnecessary to again describe them, but merely to mention that a large image of the Sun is formed by means of a heliostat and projected on to a screen in the observatory. Behind this screen, and standing on a pier of concrete, is placed a Boys radio-micrometer. A small pinhole in the screen admits radiant heat into the radio-micrometer. By placing any part of the solar image over the pinhole we can measure the relative radiation of this part. Two long rods and handles come into the observatory from the heliostat, and by turning these any desired part of the solar image can be accurately placed over the pinhole aperture. The driving clock of the heliostat then keeps it in this position while an observation is being made. The standard to which all the values of radiation from spots &c. are compared is the value on an arbitrary scale of the deflection of the radio-micrometer when the centre of the solar image is allowed to fall into the pinhole aperture in the screen.

In taking an observation, the zero position of the spot of light on the scale when the pinhole is closed is first noted, and its value entered in column Z. The umbra of a spot is then placed, by means of the slow-motion handles, on the pinhole, which is then opened. The amount of deflection produced is then entered in column U. The image is then moved so that a portion near the spot, but at the same distance from the limb, falls into the pinhole. The deflection from this is entered in column N. And finally the solar image is placed centrally, and the radiation from the centre of the disc is entered in column C.

When the values in column Z are subtracted from those in U, N, and C, we get comparative values of the radiation from the umbra, the neighbourhood, and the centre of the Sun.

In a former paper † it has been shown that the deflections of the radio-micrometer are, at any rate up to 20°, strictly proportional to the amount of radiant energy falling on the instrument. We are therefore authorised in taking these values as

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* *Proceedings of the Royal Society*, vol. lv.

† "Effective Temperature of the Sun," Wilson and Gray, *Phil. Trans.* vol. clxxxv. A.

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